Memorandum

To: Chris Hempleman
Cc: Dustin Bilhimer, Greg Pelletier, Kirk Sinclair, Lawrence Sullivan, Trevor Swanson, Karol Erickson
From: Mindy Roberts
Date: August 18, 2005
Subject: Deschutes River, Capitol Lake, Budd Inlet TMDL
Quarterly Progress Reports #8 and #9 (January through March 2005 and April through June 2005)

Introduction

The Deschutes River, Capitol Lake, Budd Inlet, and tributaries were placed on the 1996 and/or 1998 Clean Water Act Section 303(d) list of impaired waters based on historical monitoring by several organizations. In total, 24 water bodies have water quality parameter levels that do not meet standards for at least one of the following: temperature, fecal coliform bacteria, dissolved oxygen, pH, nutrients, or fine sediment. The TMDL study began in March 2003 to assess the current condition of the water bodies and to identify and quantify factors contributing to the impairments. The previous quarterly progress reports (July 31, 2003; December 1, 2003; February 9, 2004; April 15, 2004; August 30, 2004; October 29, 2004; and February 28, 2005) summarized the results of the 2003 and 2004 monitoring programs.

This memorandum summarizes the progress to date related to data collection, data analysis, and project communications. Data presented are provisional; data quality has not been checked.

Progress to Date

Temperature and Hydrogeology Data Collection

Department of Ecology continues to maintain three temperature monitoring stations along the Deschutes River to evaluate long-term temperature patterns. The stations may remain in place following the completion of the TMDL study pending future staffing constraints. This is part of a long-term data collection initiative of the Environmental Assessment Program and not limited to the Deschutes study. Summer 2005 data will be presented in subsequent quarterly reports, although data analysis and modeling for the TMDL will be limited to 2003 and 2004.

Conventional Water Quality Parameter Data Collection and Planning

Routine monitoring concluded in December 2004. No additional data analyses have been completed.

Results from 2001 Capitol Lake study conducted by CH2MHill for Miller Brewing Company will be used as input for the Capitol Lake model being developed by Edinger Associates. Relevant tables were scanned and all data were verified prior to completion of a database.

Stormwater Monitoring

A storm event occurred March 29, when 0.68 inches of precipitation fell at Olympia Airport. Two days prior to the event, a strong storm produced 2.46 inches of precipitation in Olympia; while

the primary hydrologic pulse had likely passed through the watersheds, lingering effects may have been present.

Grab samples were collected once per storm in each of the subwatersheds and analyzed for nutrients. Table 1 summarizes the nutrient results. At some sites, most of the total nitrogen was in dissolved form, but significant particulate nitrogen was evident at Ayer, Butler, Indian, Mission, and Moxlie. Nitrate levels were higher than those recorded during the routine monitoring events, as were ammonium levels. Total phosphorus was higher than orthophosphate, and most of the phosphorus was in particulate form. Organic carbon levels also were much higher than during routine monitoring.

Two samples were collected from each station during the storm. Table 2 presents the fecal coliform data for the storm event. Concentrations were somewhat higher than occur during routine monitoring at many sites, but similar at Ayer Creek and Black Lake Ditch. Concentrations at Adams, Indian, and Moxlie sites tended to be lower than during routine monitoring, suggesting a continuous dry-weather source dominates fecal coliform levels at those sites. Ellis Creek concentrations were among the highest found during stormwater monitoring.

Capitol Lake Bathymetry Survey

We continued to coordinate with USGS on bathymetric survey data. Ecology SEA Program and USGS staff began to fill in missing data in South Basin and Percival Cove during data collection relevant to the Deschutes Estuary Feasibility Study.

Communication and Coordination

- Mindy Roberts discussed data collection activities relevant to the sediment components with Mary Raines (NWIFC) January 3. Compiled and sent files.
- Mindy Roberts discussed LiDAR data available with George Kaminsky (Ecology SEA Program) on January 13 to support the Deschutes Estuary Feasibility Study vegetation mapping efforts. Provided CD of data January 24.
- Chris Hempleman and Mindy Roberts met with Thurston County, Thurston Conservation District, and City of Olympia February 3 to discuss follow-up monitoring proposed for bacteria.
- Mindy Roberts, Dustin Bilhimer, Trevor Swanson, and Lawrence Sullivan presented overview of 2004 monitoring data to the Technical Advisory Group on March 3. Presentation slides are available on the Deschutes River TMDL web page (http://www.ecy.wa.gov/programs/wq/tmdl/watershed/deschutes/index.html) under Technical Information.
- Chris Hempleman and Mindy Roberts attended a March 7 meeting with Department of Fish and Wildlife staff regarding the Tumwater hatcheries plan. Ecology stated that the facility must wait for a wasteload allocation under the current TMDL before any permit could be issued. At present, the two project schedules are consistent.
- Mindy Roberts reviewed monitoring conducted by DFW during three hatchery tank cycles in spring 2005. Data indicate the current facility adds approximately 1 kg orthophosphate and 15 to 20 kg ammonia during a two-week cycle. Analysis was discussed with Rich Eltrich and Hal Michael on March 17.
- Mindy Roberts provided Jeff Dickison with a summary of Ayer Creek water quality data collected during the study in March.

- On March 22 and April 11, respectively, Mindy Roberts discussed potential modifications to Thurston County's proposed Capitol Lake monitoring program with Nathaniel Jones (General Administration) and Sue Davis (Thurston County).
- Mindy Roberts responded to questions posted on the Deschutes list-serv on June 6.
- Mindy Roberts discussed Ecology's in-kind contribution for the Deschutes Estuary feasibility study with Perry Lund on June 6.

Project Schedule and Upcoming Tasks

All but the stormwater monitoring program were completed in December 2004. In addition to completing remaining data collection, we will begin analyzing data and preparing water quality models:

- Track storms for potential wet-weather sampling events.
- Continue to maintain long-term Deschutes River temperature monitoring stations at Henderson Rd., the USGS gage at Rainier, and downstream of the Vail Tree Farm.
- Begin developing QUAL2KW model of the Percival system and continue with the development of the Deschutes River QUAL2KW model for temperature, DO, and pH.

We distributed the previous quarterly report via the Deschutes website in February 2005. The next quarterly report will be prepared and distributed in September 2005.

Tables and Figures

Table 1. Nutrient concentrations in grab samples collected during March 29, 2005 storm event.

Subbasin	Station	TPN	DTPN	NO2NO3	NH3	TP	OP	TOC	DOC
Adams	13-ADA-00.5	0.992	0.927	0.467	0.022	0.0335	0.0096	12.9	12.7
Adams	13-ADA-UNK	1.370	1.350	0.632	0.019	0.0958	0.0473	11.3	11.3
Ayer	13-AYE-00.0	1.320	0.978	0.246	0.031	0.1140	0.0595	11.0	11.3
Butler	13-BUT-00.1	2.080	1.210	1.030	0.011	0.0415	0.0130	4.9	5.1
Ellis	13-ELL-00.0	1.120	1.160	0.807	0.022	0.0671	0.0170	10.6	10.9
Indian	13-IND-00.2	1.450	0.868	0.851	0.026	0.0537	0.0120	9.7	9.6
Indian	QA1 (IND-00.2)	1.370	1.340	0.832	0.024	0.0524	0.0120	9.7	9.5
Mission	13-MIS-00.1	1.760	1.090	1.110	0.016	0.0604	0.0250	10.0	10.6
Moxlie	13-MOX-00.0	1.560	0.885	0.904	0.051	0.0870	0.0452	6.7	1.9
Percival	13-PER-00.1	0.944		0.368	0.018	0.0287	0.0093	5.6	6.2
Spurgeon	13-SPU-00.0	1.180	0.971	0.599	0.014	0.0406	0.0200	6.8	6.2

Table 2. Fecal coliform concentrations in grab samples collected during March 29, 2005 storm event.

Subbasin	Station	Morning	Afternoon
Adams	13-ADA-00.5	170	63
Adams	13-ADA-UNK	230	140
Ayer	13-AYE-00.0	45	31
Black Lake	13-BLA-00.0	32	36
Black Lake	13-BLA-02.3	12	10
Butler	13-BUT-00.1	84	32
Butler	13-BUT-NW	92	49
Butler	13-BUT-SE	80	35

Butler	13-BUT-SW	120	100
Ellis	13-ELL-00.0	670	340
Ellis	13-ELL-33RD	190	130
Indian	13-IND-00.2	280	180
Indian	13-IND-12TH	62	60
Indian	13-IND-BOUL	340	62
Indian	13-IND-FRED	200	210
Indian	13-IND-MART	130	150
Indian	13-IND-SBAX	62	62
Indian	13-IND-WHEE	370	220
Mission	13-MIS-00.1	170	77
Mission	13-MIS-BETH	240	130
Mission	13-MIS-ETHR	100	94
Moxlie	13-MOX-00.0	400	260
Moxlie	13-MOX-00.6	250	160
Moxlie	13-MOX-5TH	250	130
Moxlie	13-MOX-8TH	320	130
Moxlie	13-MOX-PARK	10	6
Moxlie	13-MOX-PLUM	170	150
Percival	13-PER-00.1	48	27
Percival	13-PER-01.0	80	71
Percival	13-PER-54TH	180	200
Spurgeon	13-SPU-00.0	40	64
Spurgeon	13-SPU-EQUU	19	17
Spurgeon	13-SPU-LATI	29	30
Spurgeon	13-SPU-MOOD	31	41